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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOACHIM WOLF and ANDREAS KAMMANN

Appeal 2009-002322
Application 10/627,080
Technology Center 3600

Decided: September 25, 2009

Before WILLIAM F. PATE, III, STEVEN D.A. McCARTHY and KEN B. BARRETT, *Administrative Patent Judges*.

McCARTHY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134 (2002) from the Examiner's decision finally rejecting claims 1-3 and 9-12 under 35 U.S.C. § 103(a) (2002) as being unpatentable over Baker (US 4,936,811, issued Jun. 26, 1990) and Devers (US 6,672,596 B2, issued Jan. 6, 2004); finally

rejecting claims 13 and 15 under § 103(a) as being unpatentable over Takeda (JP 56-62464, issued Oct. 19, 1979)[1] and the Examiner's Official Notice finding that "it is well known to one of ordinary skill in the art to use a rivet as a means to connect two pieces" (Ans. 4); and finally rejecting claims 16-19 under § 103(a) as being unpatentable over Takeda and Devers. The Examiner objects to claim 6 but indicates that the subject matter of the claim is allowable. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

We AFFIRM.

The claims on appeal relate to axle boots for sealing joints in motor vehicle drive trains. (Spec. 1, ¶ 0002). Claim 1 is typical of the claims on appeal:

> 1. An axle boot for joint sealing, comprising:
>
> a joint housing including an external contour having a plurality of radial recesses;
>
> a substantially axisymmetric bellows including an integral connecting collar formed as a single piece, the connecting collar including a plurality of indentations projecting radially inward, each indentation adapted to one of the radial recesses;
>
> a plurality of compensating pieces connected to one another by a plurality of ring sections to form a single piece component surrounding an outer circumference of the connecting collar, the single piece component having a cylindrical outer circumferential surface, wherein at least one of the ring sections is elastically deformable sufficient to enable the

[1] Page citations to Takeda will be to an English-language translation entered in the record of the underlying application.

single piece component to expand to a circumference larger than the outer circumference of the connecting collar; and

a circumferential clamp surrounding and contacting the single piece component.

ISSUES

The Appellants argue claims 1-3 and 10-12 as a group for purposes of the rejection of those claims under § 103(a). (App. Br. 9-11; Reply Br. 2). Claim 1 is representative of the group. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2008). The Examiner finds that Baker discloses each limitation of claim 1 except at least one ring section sufficiently elastically deformable to enable the single piece component to expand to a circumference larger than the outer circumference of the connecting collar. (Ans. 3). The Examiner concludes that "it would have been obvious . . . to modify the compensating component of Baker with the unified component taught by Devers to provide a more uniform sealing and clamping force." (Ans. 3-4). The Appellants contend that one of ordinary skill in the art would have had no reason to connect the individual segmented band segments disclosed by Baker in an elastically deformable manner, and that Baker teaches away from elastically deformable solutions. (App. Br. 10; Reply Br. 2).

Two issues arising in this appeal are:

Have the Appellants shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring sections forming a single piece

component, the ring sections being elastically deformable sufficient to enable the single piece component to expand to a circumference larger than the outer circumference of an integral connecting collar of a bellows?

Have the Appellants shown that the Examiner erred in concluding that Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring sections forming a single piece component, the ring sections being elastically deformable sufficient to enable the single piece component to expand to a circumference larger than the outer circumference of an integral connecting collar of a bellows because Baker teaches away from such a combination?

The Appellants argue the rejection of claim 9 separately, contending that neither Baker nor Devers discloses "each compensating piece includ[ing] . . . more than one material component, each of the material components having a different hardness." (App. Br. 11). The Examiner responds that Figures 1, 2 and 4 of Devers depict compensating pieces including wall segments and inserts of different materials having different hardnesses. (Ans. 6-7).

Another issue arising in this appeal is:

Have the Appellants shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring a plurality of compensating pieces, each

compensating piece including more than one material component, and each material component having a different hardness?

The Appellants also argue claims 13 and 15 separately. The Appellants contend that Takeda fails to disclose either connecting the plurality of compensating pieces to a clamp using at least one rivet as recited in claim 13, or the limitation separately recited in claim 15, namely, that a circumferential length of each of the plurality of compensating pieces corresponds approximately to a circumferential length of an associated radial recess in the joint housing. (App. Br. 12). The Examiner concludes that it would have been obvious to use a rivet to connect a compensating piece to the collar. The Examiner finds that Takeda discloses the limitation separately recited in claim 15. (Ans. 4).

Two more issues arising in this appeal are:

Have the Appellants shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Takeda and the fact taken by Official Notice would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring a plurality of compensating pieces connected to a clamp using at least one rivet?

Have the Appellants shown that the Examiner erred in finding that Takeda discloses an axle boot ring including a plurality of compensating pieces, a circumferential length of each of the compensating pieces corresponding approximately

to a circumferential length of an associated radial recess in a joint housing?

The Appellants argue claims 16-19 separately for purposes of the rejection of the claim under § 103(a). The Appellants contend, with respect to each of claims 16-19, that the combined teachings of Takeda and Devers would have provided one of ordinary skill in the art no reason to modify a boot of the type disclosed by Takeda so as to meet the limitations of each claim. (App. Br. 13). The Appellants contend that Devers does not disclose compensating pieces having radial supporting webs. (*Id.*) The Examiner concludes that it would have been obvious to modify the boot of Takeda in view of Devers "to provide a more uniform sealing and clamping force." (Ans. 4-5).

Two more issues arising in this appeal are:

Have the Appellants shown that the Examiner erred in finding that Devers discloses an axle boot including a plurality of compensating pieces, each of which includes at least one radial supporting web?

Have the Appellants shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Takeda, Devers and the fact taken by Official Notice would have provided one of ordinary skill in the art reason to incorporate the limitations separately recited in each of claims 16-19 into an axle boot, as recited in independent claim 13?

FINDINGS OF FACT

The record supports the following findings of fact ("FF") by a preponderance of the evidence.

1. Baker discloses a tripot constant velocity ["CV"] joint *10* including a joint housing *16*. Baker's housing *16* has three axially extending lobes *16a* separated by axially extending, generally concave depressions *16b*. (Baker, col. 3, ll. 27-30).

2. Baker's CV joint *10* also includes a convoluted, flexible polymeric boot or bellows *12*. (Baker, col. 3, ll. 35-39). Figures 1-3 of Baker depict the boot *12* as being substantially axisymmetric.

3. The boot *12* has at its larger end *14* a sleeve *15*. (Baker, col. 3, ll. 35-39). Figure 2 of Baker depicts the boot *12* as being formed as a single piece including the sleeve *15*, which is integral with the remainder of the boot *12*.

4. Baker's CV joint also includes a three-piece segmental band *22*. (Baker, col. 3, ll. 39-42). Baker's three-piece segmental band *22* has an outer contour which forms a circle, and an inner contour sized and configured to encircle the outside of the joint housing *16* and the correspondingly shaped sleeve *15* of the boot *12*. (Baker, col. 4, ll. 4-8). Baker's three-piece segmental band *22* consists of three segmented band sections *30* connected at their longitudinal ends by complementary tongues *34* and grooves *36* to form a single piece component *22*. (Baker, col. 4, ll. 14-16).

5. Baker's CV joint also includes a low profile clamp *23* which encircles the sleeve *15* to cause the boot *12* to grip the joint housing *16*. (Baker, col. 3, ll. 39-42). Figure 3 of Baker shows the low profile clamp *23*

seated in a clamp receiving slot or groove *37* in contact with the three-piece segmental band *22*.

6. Baker discloses injection molding the boot *12* from a thermoplastic elastomer ["TPE"]. (Baker, col. 3, ll. 65-68). Baker also discloses injection molding each of the segmented band sections *30* from the same TPE. (Baker, col. 4, ll. 10-13).

7. Baker discloses slipping the sleeve *15* over the joint housing *16* during assembly. (Baker, col. 4, ll. 27-31). The three-piece segmental band *22* is fitted over the sleeve *15* of the boot *12* after the sleeve *15* is slipped over the joint housing *16*. (Baker, col. 4, ll. 31-34).

8. Baker criticizes a prior art joint structure including a TPE filler ring placed between the joint housing and the convoluted boot or bellows. Baker teaches that this arrangement forces the clamp to compress a more rigid material, namely, the material of the convoluted boot, down on a more flexible material, namely, the TPE of the filler ring. (Baker, col. 2, ll. 22-35).

9. Baker teaches forming the segmented band sections *30* from the same TPE used to mold the boot *12*. Baker also teaches connecting the sections *30* by means of the complementary tongues *34* and grooves *36* so as to allow the individual sections to move freely in a circumferential direction into alignment with the depressions *16b* of the housing *16*. As a result of these features, Baker's three-piece segmental band *22* effectively transmits the clamping force imposed by the low profile clamp *23* to the boot *12*. (Baker, col. 2, ll. 63-68).

10. Devers discloses a tripot universal joint *10* including a joint housing *12*. (Devers, col. 2, ll. 62-63). Devers' joint housing *12* includes

three circumferentially spaced and longitudinally extending drive channels *18*. The joint housing *12* also includes three outer wall spaces *34* defined by surfaces *34a-34c* between each of the drive channels *18*. (Devers, col. 3, ll. 1-15). Figure 2 of Devers depicts the surfaces *34a-34c* as collectively defining radial recesses in the external contour of the joint housing *12*. Devers' universal joint *10* also includes a boot seal or bellows *38*. (Devers, col. 3, ll. 36-38). Figures 1 and 2 of Devers depict the boot seal *38* as being axisymmetric.

11. Figure 1 depicts the boot seal *38* as being formed in a single piece including an integral connecting collar. Figure 2 of Devers depicts the integral connecting collar as fitting over a seal adapter *40* of the universal joint *10*.

12. Devers' seal adapter *40* includes an annular body *41*. The annular body *41* includes spaced wall inner segments *42a-42c* shaped to conform against the surfaces *34a-34c* which define the radial recesses in the external contour of the joint housing *12*. The annular body *41* also includes thin outer wall sections *42d-42f* aligned with the spaced wall inner segments *42a-42c* to define pockets *43*. The outer wall sections *42d-42f* are connected by wall segments *42g-42i* of the same radius. (Devers, col. 3, ll. 39-50). Figure 2 of Devers depicts the wall sections or segments *42d-42i* as forming a continuous, cylindrical outer circumferential surface.

13. Devers discloses a trapezoidal, cup-like plastic insert *70* (*71*) having a radial supporting rib or web *72* filling each pocket *43* in the seal adapter *40*. (Devers, col. 3, ll. 50-55 and 57-58; figs. 7 and 8). The insert *70* (*71*) is made from a polymeric material more rigid than the material from

which the wall segments or sections *42a-42i* are made. (Devers, col. 3, l. 66 – col. 4, l. 5).

14. The spaced wall inner segments *42a-42c*, the outer wall sections *42d-42f*, and the inserts *70* (*71*) together form hollow (that is, air-filled) bodies. Since the inserts *70* (*71*) are made from a polymeric material more rigid than the material from which the wall segments or sections *42a-42f* are made, the wall segments or sections *42a-42f* are flexible in comparison to the inserts *70* (*71*).

15. Devers' universal joint includes a clamp ring *48* at the end of the boot seal *38*. (Devers, col. 3, ll. 36-38 and fig. 1). Figure 2 of Devers depicts the clamp ring *48* clamping the boot seal *38* over the seal adapter *40*.

16. Devers describes the seal adapter *40* as having enough pliability to be pulled over an end *12a* of the joint housing *12* during assembly of the universal joint *10*. (Devers, col. 4, ll. 10-15).

17. Devers teaches that the inserts *70* (*71*) reinforce the portions of the seal adapter *40* that fill the outer wall spaces *34* of the housing *12*. Devers further teaches that the insert *70* (*71*) is supported within the pockets 43 of the seal adapter *40* for providing a load transfer path from the seal boot *38* to the housing member *12*. Devers teaches that the reinforced seal adapter *40* provides nearly uniform compression between the clamped seal boot *38* and the joint housing *12* despite the non-uniform configuration of the joint housing. (*See* Devers, col. 2, ll. 1-19).

18. Takeda describes a boot *24* attached to an outer member *21* which houses the parts of a universal joint. (*See* Takeda 2, l. 8 and 5, ll. 11-15). The periphery of the outer member *21* is formed into a non-circular shape that comprises convex surface parts *22* and concave surface parts *23*

that are recessed radially inwardly from the contour lines of convex surface parts *22*. (*See* Takeda 5, ll. 9-11).

19. Takeda discloses a band or circumferential clamp *27* used to tighten the boot *24* to the outer member *21*. (Takeda 5, ll. 18-21).

20. Takeda's circumferential clamp includes bulged parts or compensating pieces *28* having inwardly convex-surface-like shapes. (*Id.*) Figure 6(C) of Takeda depicts these bulged parts *28* as being connected to the band *27* in an integrated multi-component unit.

21. Figures 6(A) and 6(C) depict the lengths of the bulged parts *28* corresponding approximately to the lengths of the concave surface parts *23* formed on the outer member *21*. Defining the length of a concave surface part as the length of the circular arc connecting the two edges of each concave surface part *23* as shown on the left side of Figure 6(A), the length of the bulged part 28 shown in figure 6(C) is approximately equal to the length of the associated concave surface part *23* shown in Figure 6(A).

22. The Examiner takes Official Notice that it is well known to one of ordinary skill in the art to use a rivet as a means to connect two pieces. (Ans. 4). The Appellants do not appear to dispute this fact. (*See*, *e.g.*, App. Br. 13).

PRINCIPLES OF LAW

A claim under examination is given its broadest reasonable interpretation consistent with the underlying specification. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). In the absence of an express definition of a claim term in the specification, the claim term is given its broadest reasonable meaning in its ordinary usage as the term

would be understood by one of ordinary skill in the art. *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007); *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). Properties of preferred embodiments described in the specification which are not recited in a claim do not limit the reasonable scope of the claim. *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369 (Fed. Cir. 2003).

"[W]hen a patent claims a structure already known in the art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result" to be non-obvious under § 103(a). *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 416 (2007). Similarly, "if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the techniques is obvious unless its application is beyond his or her skill." *Id.* at 417.

As a general rule, a reference which "teaches away" from the subject matter of a claim does not support a prima facie case that the subject matter would have been obvious. A reference teaches away from the subject matter of a claim only if "a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). Prior art does not teach away from claimed subject matter merely by disclosing a different solution to a similar problem unless the prior art also criticizes, discredits or otherwise discourages the solution claimed. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

ANALYSIS

Turning to the rejection of claim 1, Baker and Devers disclose tripot joints which are similar in structure and function. For example, both Baker's CV joint and Devers' universal joint include joint housings with external contours having three radial recesses. (*See* FF 1 and 12). Both Baker's CV joint and Devers' universal joint include substantially axisymmetric bellows with integral connecting collars formed as single pieces. (*See* FF 2, 3 and 11). Finally, both Baker's CV joint and Devers' universal joint include circumferential clamps surrounding and contacting the components. (FF 5 and 15).

Devers' seal adapter *40* is structurally similar to Baker's segmented band *22*. For example, both Devers' seal adapter, which is pliable (FF 16), and Baker's segmented band, which consists of segmented band segments connected by tongue-and-groove connections (FF 4), share the property that annular portions may shift slightly relative to each other to permit more uniform transmission of forces from the clamp through the bellows to the joint housing. This structural similarity is present even if Baker's segmented band *22* fits over Baker's boot *12* (*see* FF 4), and Devers' seal adapter *40* fits within the boot seal *38* (*see* FF 11) in the particular embodiments described in those references. Devers' seal adapter *40* and Baker's segmented band *22* perform related functions. Both Devers' seal adapter *40* and Baker's segmented band *22* define inner contours corresponding to the external contours of their corresponding joint housings. (FF 4 and 12). Both Devers' seal adapter *40* and Baker's segmented band *22* define cylindrical outer circumferential surfaces (*id.*) for evenly receiving and transmitting compressive forces from the circumferential clamps.

Since Baker and Devers describe similar devices, it would have been obvious to substitute a seal adapter similar to the seal adapter *40* described by Devers (*see* FF 12 and 13) positioned over the boot seal or bellows for the three-piece segmental band *22* disclosed by Baker in a CV joint of the type described by Baker. This may be viewed either as a simple substitution of one known component for another or as the application of an improvement known from the teachings of Devers to the similar joint disclosed by Baker. The Appellants have not provided any evidence or argument sufficient to show that such a substitution or improvement would have been beyond the level of ordinary skill in the art. Neither have the Appellants provided any evidence or argument sufficient to show that the proposed substitution or improvement would have been more than a predictable use of the prior art elements according to their established functions.

Baker discloses slipping the sleeve of the boot over the joint housing and then fitting the three-piece segmental band over the sleeve after the sleeve is slipped over the joint housing. (*See* FF 7). Devers describes the seal adapter as having enough pliability to be pulled over an end of the joint housing during assembly of the universal joint. (FF 16). Given the similarity between the joints described by Baker and Devers, it would have been obvious to assemble a tripot joint by slipping the sleeve of a boot seal or bellows over the joint housing and then pulling an adapter of the type disclosed by Devers into place over the sleeve.

One of ordinary skill in the art would have sufficient problem-solving skills to provide the adapter sufficient pliability or elastic deformability to enable the adapter (which would be a single piece component) to expand to a

circumference larger than the outer circumference of the structure, namely, the connecting collar or sleeve of the bellows, over which the adapter is to be pulled. Since Devers already describes a pliable seal adapter, providing an adapter with sufficient elastic deformability to enable the adapter to expand to fit over the sleeve would have been within the level of ordinary skill in the art. The Appellants provide no evidence or argument sufficient to show that the proposed assembly process and modification of the adapter would have been more than a predictable use of prior art elements.

Baker does not teach away from these proposed substitutions, improvements and modifications merely by disclosing the use of segmented band sections interconnected by tongues and grooves rather than a pliable adapter with inserts made from a material in order to permit more uniform transmission of force from the clamp through the sleeve of the bellows to the joint housing. Baker criticizes a prior art arrangement using a pliable adapter or filler ring placed *between* the sleeve of the bellows and the housing. (FF 8). Baker does not criticize or disparage the use of a pliable adapter positioned *over both* the bellows and the housing. Baker does not teach away from the proposed substitutions, improvements and modifications merely because Baker teaches a different solution to a related problem.

Turning to the rejection of claim 9, Devers' seal adapter *40* includes spaced wall inner segments *42a-42c* shaped to conform against the surfaces *34a-34c* which define the radial recesses in the external contour of the joint housing *12*; thin outer wall sections *42d-42f* aligned with the spaced wall inner segments *42a-42c* to define pockets *43*; and trapezoidal, cup-like plastic inserts *70* (*71*) filling the pockets *43*. (FF 12 and 13). The inserts *70*

(*71*) are made from a polymeric material more rigid than the material from which the wall segments or sections *42a-42i* are made. (FF 13). Devers teaches that the inserts *70* (*71*) reinforce the portions of the seal adapter *40* that fill the outer wall spaces *34* of the housing *12*, and that the reinforced seal adapter *40* provides nearly uniform compression between the clamped seal boot *38* and the joint housing *12* despite the non-uniform configuration of the joint housing. (FF 17).

One of ordinary skill in the art substituting a seal adapter similar to the seal adapter *40* described by Devers positioned over the sleeve of the boot seal or bellows for the three-piece segmental band disclosed by Baker would have had reason to substitute a seal adapter having spaced inner wall segments and inserts made from a polymeric material more rigid than the material from which the wall inner segments are made. As the Examiner points out, the arrangement would have provided a more uniform sealing and clamping force on the bellows and the joint housing. (*See* Ans. 3-4).

The Examiner interprets the term "compensating pieces" sufficiently broadly to encompass the combination of spaced inner wall segments and inserts made from a polymeric material more rigid than the material from which the wall inner segments are made. (*See* Ans. 6-7). The Appellants do not point out any definition of the term "compensating pieces" in the Specification or any ordinary usage of the term which would exclude the combination of the spaced inner wall segments and inserts from the scope of the term. The combined teachings of Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring a plurality of compensating pieces, each compensating piece

including more than one material component and each material component having a different hardness.

Turning to the rejection of claim 13, Takeda describes a boot attached to an outer member or joint housing which houses the parts of a universal joint. The periphery of the outer member includes inwardly recessed concave surface parts. (FF 18). Takeda also discloses a band or circumferential clamp *27* used to tighten the boot *24* to the outer member *21*. (FF 19). Takeda's circumferential clamp includes bulged parts or compensating pieces *28* having inwardly convex-surface-like shapes. Takeda depicts these bulged parts *28* as being connected to the band *27* in an integrated multi-component unit. (FF 20).

Takeda does not disclose how the bulged parts are connected to the band. The Examiner found, and the Appellants do not dispute, that it was well known to one of ordinary skill in the art to use a rivet as a means to connect two pieces. (FF 22). It would have been obvious to use at least one rivet to connect each of the bulged parts or connecting pieces to the band. Although the Appellants contend that the bulged parts disclosed by Takeda do not appear to be rivetable to the band, the Appellants provide neither evidence nor argument sufficient to show that connecting the bulged portions to the band would have been beyond the level of ordinary skill in the art. Neither have the Appellants provided any evidence or argument sufficient to show that riveting the bulged parts to the band would have involved more than a predictable use of prior art elements according to their established functions. The Appellants have not shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Takeda and the fact taken by Official Notice

would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring a plurality of compensating pieces connected to a clamp using at least one rivet.

Turning to the rejection of claim 15, the Examiner correctly found (*see* Ans. 7-8) that the circumferential length of each of Takeda's bulged portions or compensating pieces *28* corresponds approximately to a circumferential length of an associated radial recess. (*See* FF 21). The Appellants provide no evidence or argument sufficient to show that the Examiner either interpreted the claim term "corresponds approximately" unreasonably broadly or that the Examiner's finding is in error.

Turning to the rejections of claims 16-19, the Appellants contend that Takeda and Devers fail to disclose each of the plurality of compensating pieces including at least one radial web as recited in claim 19 (App. Br. 13), but do not dispute the Examiner's findings that Takeda or Devers disclose the limitations separately recited in claims 16-18 (*see id.*). The Examiner correctly found (*see* Ans. 8) that Devers discloses compensating pieces. Each of Devers' compensating pieces includes spaced wall inner segments shaped to conform against radial recesses in the external contour of the joint housing; thin outer wall sections aligned with the spaced wall inner segments to define pockets; and cup-like plastic inserts having radial supporting webs. (FF 12 and 13). That is, the Examiner correctly found (*see* Ans. 8) that each of Devers' compensating pieces includes at least one radial support web. (FF 13).

It would have been obvious to substitute compensating pieces of the type disclosed by Devers, including spaced wall inner segments shaped to conform against radial recesses in the external contour of the joint housing;

thin outer wall sections aligned with the spaced wall inner segments to define pockets; and cup-like plastic inserts having radial supporting webs, in place of the bulge parts disclosed by Takeda. To the extent that the mere substitution of Devers' known compensating pieces for Takeda's bulge parts in Takeda's known joint would not be obvious in and of itself, the Appellants provide no reason why the Examiner's reasoning, namely, that one of ordinary skill in the art would have had reason to make the substitution to provide more uniform sealing and clamping forces (*see* Ans. 4-5), lacks rational underpinning or fails to support the conclusion that the substitution would have been obvious.

Although the Appellants contend that the bulged parts disclosed by Takeda do not appear to be rivetable to the band, the Appellants provide neither evidence nor argument sufficient to show that riveting compensating pieces of the type disclosed by Devers to a band of the type disclosed by Takeda would have been beyond the level of ordinary skill in the art. Neither have the Appellants provided any evidence or argument sufficient to show that riveting compensating pieces of the type disclosed by Devers to the band would have involved more than a predictable use of prior art elements according to their established functions. In other words, the Appellants have not shown that the Examiner failed to articulate reasoning having rational underpinning sufficient to support the conclusion that the subject matter of claims 16-19 would have been obvious.

CONCLUSIONS

The Appellants have not shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the

conclusion that Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring sections forming a single piece component, the ring sections being elastically deformable sufficient to enable the single piece component to expand to a circumference larger than the outer circumference of an integral connecting collar of a bellows.

The Appellants have not shown that the Examiner erred in concluding that Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring sections forming a single piece component, the ring sections being elastically deformable sufficient to enable the single piece component to expand to a circumference larger than the outer circumference of an integral connecting collar of a bellows because Baker teaches away from such a combination. Therefore, the Appellants have not shown that the Examiner erred in rejecting claims 1-3 and 10-12 under § 103(a) as being unpatentable over Baker and Devers.

The Appellants have not shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Baker and Devers would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring a plurality of compensating pieces, each compensating piece including more than one material component and each material component having a different hardness. Therefore, the Appellants have not shown that the Examiner erred in rejecting claim 9 under § 103(a) as being unpatentable over Baker and Devers.

The Appellants have not shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the

conclusion that Takeda and the fact taken by Official Notice would have provided one of ordinary skill in the art reason to incorporate into an axle boot ring a plurality of compensating pieces connected to a clamp using at least one rivet. Therefore, the Appellants have not shown that the Examiner erred in rejecting claim 13 under § 103(a) as being unpatentable over Takeda and the fact taken by Official Notice.

The Appellants have not shown that the Examiner erred in finding that Takeda discloses an axle boot ring including a plurality of compensating pieces, a circumferential length of each of the compensating pieces corresponding approximately to a circumferential length of an associated radial recess in a joint housing. Therefore, the Appellants have not shown that the Examiner erred in rejecting claim 15 under § 103(a) as being unpatentable over Takeda and the fact taken by Official Notice.

The Appellants have not shown that the Examiner erred in finding that Devers discloses an axle boot including a plurality of compensating pieces, each of which includes at least one radial supporting web.

The Appellants have not shown that the Examiner failed to articulate reasoning with some rational underpinning sufficient to support the conclusion that Takeda, Devers and the fact taken by Official Notice would have provided one of ordinary skill in the art reason to incorporate the limitations separately recited in each of claims 16-19 into an axle boot as recited in independent claim 13. Therefore, the Appellants have not shown that the Examiner erred in rejecting claims 16-19 under § 103(a) as being unpatentable over Takeda, Devers and the fact taken by Official Notice.

DECISION

We AFFIRM the Examiner's decision rejecting claims 1-3, 9-13 and 15-19.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

mls

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